Complete Summary

GUIDELINE TITLE

Wisconsin essential diabetes mellitus care guidelines.

BIBLIOGRAPHIC SOURCE(S)

Wisconsin Diabetes Advisory Group. Wisconsin diabetes mellitus essential care guidelines. Madison (WI): Wisconsin Diabetes Prevention and Control Program; 2008. Various p. [17 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Wisconsin Diabetes Advisory Group. Wisconsin essential diabetes mellitus care guidelines. Madison (WI): Wisconsin Diabetes Prevention and Control Program; 2004. Various p. [246 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

- Pre-diabetes
- Diabetes mellitus (type 1, type 2, gestational)
- Diabetes-related complications (diabetic foot ulceration, diabetic foot infection, Charcot foot, diabetic neuropathy, diabetic retinopathy, diabetic kidney disease, periodontal disease)

GUIDELINE CATEGORY

Counseling
Diagnosis
Evaluation
Management
Prevention
Risk Assessment
Screening
Treatment

CLINICAL SPECIALTY

Cardiology
Dentistry
Dermatology
Emergency Medicine
Endocrinology
Family Practice
Gastroenterology
Geriatrics
Infectious Diseases
Internal Medicine
Nephrology
Neurology
Nursing
Nutrition
Obstetrics and Gynecology
Ophthalmology
Optometry
Pediatrics
Pharmacology
Physical Medicine and Rehabilitation
Podiatry
Preventive Medicine
Psychiatry
Psychology
Urology

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Dentists
Dietitians
Emergency Medical Technicians/Paramedics
Health Care Providers
Health Plans
Hospitals
Managed Care Organizations
Nurses
Pharmacists
Physical Therapists
Physician Assistants

Physicians
Podiatrists
Psychologists/Non-physician Behavioral Health Clinicians
Public Health Departments
Social Workers
Students

GUIDELINE OBJECTIVE(S)

- To update the 2004 *Wisconsin Diabetes Mellitus Essential Care Guidelines* by incorporating the latest scientific evidence regarding good diabetes care
- To provide recommendations, which serve as a guide for the prevention and management of diabetes mellitus
- To provide a concise, general framework for the care of diabetes and prevention of diabetes-related complications
- To improve care and enhance quality of life for people with diabetes

TARGET POPULATION

Patients with type 1 and type 2 diabetes mellitus, pre-diabetes, and pre-gestational or gestational diabetes

INTERVENTIONS AND PRACTICES CONSIDERED

General Care

1. Diabetes-focused visit including assessment of physical activity, diet, weight, body mass index (BMI), growth, and review of management plan
2. Self-management education
3. Medical nutrition therapy (MNT)
4. Glycemic control including:
    - A1c testing
    - Review of self-monitoring of blood glucose (SMBC)
    - Review of medication management monitoring, side effects, and hypoglycemic episodes
    - Glucose-lowering agents alone or in combination with one or more oral agents and/or insulin
5. Referral to specialists, as appropriate
6. Essential patient education

Cardiovascular Care

1. Lifestyle modification
2. Tobacco cessation
3. Lipid assessment and monitoring
4. Statin therapy combined with lifestyle changes
5. Blood pressure control
6. Aspirin prophylaxis

Kidney Care

1. Obtaining albumin/creatinine ratio, serum creatinine for estimated glomerular filtration rate (eGFR), and routine urinalysis, as appropriate
2. Angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARB) and aggressive blood pressure therapy

Eye Care

1. Dilated eye exams
2. Anti-vascular endothelial growth factor (anti-VEGF) treatment
3. Referral to ophthalmologist or optometrist and coordination of care

Neuropathies and Foot Care

1. Classification of diabetic neuropathy
2. Routine and comprehensive foot exams
3. Risk categorization
4. Management of foot ulceration and infection
5. Management of Charcot foot

Oral Care

1. Oral screening
2. Dental exam
3. Medical-dental collaboration

Emotional and Sexual Health Care

1. Assessment of emotional health, depression screening and recommendations, including postpartum depression
2. Assessment of sexual health concerns

Influenza and Pneumococcal Immunizations

Providing influenza and pneumococcal immunizations

Preconception and Pregnancy Care

1. Preconception counseling
2. Assessment of contraception/discuss family panning
3. Screening for gestational diabetes and type 2 diabetes post-gestational diabetes mellitus
4. Treatment of gestational diabetes
5. Postpartum screening, breastfeeding, and lactation counseling

Identification and Diagnosis of Pre-Diabetes and Type 2 Diabetes

1. Opportunistic and community screening
2. Fasting plasma glucose or oral glucose tolerance test

MAJOR OUTCOMES CONSIDERED

- Efficacy of management strategies at preventing, delaying, or reducing the risk of diabetes-related complications
- Glycemic control
- Quality of life
- Cost-effectiveness of care

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The *Guidelines*, originally published in 1998 and revised in 2001 and 2004, were again revised in 2008 to incorporate the latest scientific evidence regarding good diabetes care. The Wisconsin Diabetes Advisory Group and other health care

professionals collaborated with the Wisconsin Diabetes Prevention and Control Program staff to update the *Guidelines*.

The following national and international studies were instrumental in shaping previous versions of the Guidelines and continue to shape the current Guidelines version for Wisconsin:

- Diabetes Control and Complications Trial
- United Kingdom Prospective Diabetes Study
- Diabetes Prevention Program

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

Optimal glycemic control is cost-effective and improves quality of life as well as reduces microvascular, and possible macrovascular, disease. It is estimated that for every one percent decrease in A1c, there is a 14-20% decrease in hospitalizations, resulting in $4-5 billion savings in direct health care costs alone.

METHOD OF GUIDELINE VALIDATION

Comparison with Guidelines from Other Groups
External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The authors of these Guidelines, the Wisconsin Diabetes Advisory Group, and many other individuals were involved in the review and revision of various drafts and the final document.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The following table presents a brief summary of the diabetes mellitus essential care guidelines. For details and references for each specific area, please refer to the full text guideline.

Concern	Care/Test	Frequency
General Recommendations for Care	• Perform diabetes-focused visit • Review management plan; assess barriers and goals • Assess physical activity level • Assess nutrition/weight/body	*Type 1*: Every 3 months* *Type 2*: Every 3-6 months* Each focused visit; revise

Concern	Care/Test	Frequency
	mass index (BMI)/growth	as needed Each focused visit Each focused visit
Self-Management Education	• Refer to diabetes educator, preferably a certified diabetes educator (CDE) in an American Diabetes Association (ADA) Recognized Program; curriculum to include the ten key areas of the national standards	At diagnosis, then every 6-12 months, or more as needed
Medical Nutrition Therapy	• Refer for medical nutrition therapy (MNT) provided by a registered dietician (RD), preferably one who is also a certified diabetes educator	At diagnosis or first referral to RD: 3 to 4 visits, completed in 3 to 6 months; then, annually. RD determines additional visits based on needs/goals.
Glycemic Control	• Check A1c; goal: <7.0% (always individualize) (ADA recognizes goal of <7.0%) (American Association of Clinical Endocrinologists [AACE] recognizes goal of ≤6.5%) • Review goals, medications, side effects, and frequency of hypoglycemia • Assess self-blood glucose monitoring schedule	*Type 1:* Every 3 months* *Type 2:* Every 3-6 months* Each focused visit Each focused visit, 2-4 times/day, or as recommended
Cardiovascular Care	• Check fasting lipid profile *Adult goals*: Total Cholesterol <200 mg/dL Triglycerides <150 mg/dL High-density lipoprotein (HDL) ≥40 mg/dL (men) HDL ≥50 mg/dL (women)	*Children*: After age 2 but before age 10. Repeat annually if abnormal, repeat in 3-5 years if normal. *Adults*: Annually. If abnormal, follow National Cholesterol Education Program (NCEP) III guidelines.

Concern	Care/Test	Frequency
	Non-HDL (Cholesterol) <130 mg/dL Low-density lipoprotein (LDL) <100 mg/dL (optimal goal) LDL <70 mg/dL (for **very** high risk) • Start statin with ongoing lifestyle changes • Check blood pressure • Adult goal: <130/80 mmHg • Assess smoking/tobacco use status • Start aspirin prophylaxis (unless contraindicated)	*Adults with cardiovascular disease (CVD); Age >40 yrs with one or more risk factors for CVD* *Children*: Each focused visit; follow National High Blood Pressure Education Program recommendations for Children and Adolescents *Adults*: Each focused visit Each visit; (5As: Ask, Advise, Assess, Assist; Arrange) Age >40 yrs with diabetes; Age ≤40 yrs, individualize based on risk
Kidney Care	• Check albumin/creatinine ratio using a random urine sample, also called urine microalbumin/creatinine ratio • Check serum creatinine and estimated glomerular filtration rate (GFR) • Perform routine urinalysis	*Type 1*: At puberty or after 5 years duration, then annually *Type 2*: At diagnosis, then annually At diagnosis, then annually At diagnosis, then as indicated
Eye Care	• Dilated eye exam by an ophthalmologist or optometrist	*Type 1*: If age ≥10, within 3-5 years of onset, then annually *Type 2*: At diagnosis, then annually; two exceptions exist
Neuropathies and Foot Care	• Assess/screen for neuropathy (autonomic/distal symmetric polyneuropathy [DPN]) • Visual inspection of feet with shoes and socks off • Perform comprehensive lower extremity/foot exam	*Type 1*: Five years after diagnosis, then annually *Type 2*: At diagnosis, then annually Each focused visit; stress

Concern	Care/Test	Frequency
	(use monofilament and tuning fork) • Screen for peripheral vascular disease (PVD) (consider ankle-brachial index [ABI])	daily self-exam At diagnosis, then annually At diagnosis, then annually
Oral Care	• Inspect gums and teeth for signs of periodontal disease • Dental exam by general dentist or periodontal specialist	At diagnosis, then each focused visit At diagnosis, then every 6 months (if dentate) and every 12 months (if edentate
Emotional/Sexual Health Care	• Assess emotional health; screen for depression • Assess sexual health concerns	Each focused visit Each focused visit
Immunizations	• Provide influenza vaccine • Provide pneumococcal vaccine	Annually, if age ≥6 months Once; then per Advisory Committee on Immunization Practices
Preconception and Pregnancy Care	• Provide preconception counseling/assessment • Assess contraception/discuss family planning • Assess risk for gestational diabetes mellitus (GDM) • Screen for GDM • Screen for Type 2 diabetes post-GDM	3-4 months prior to conception** At diagnosis and each focused visit** At first prenatal visit (if high risk, screen immediately for GDM)** At 24-28 weeks gestation or earlier if high risk** At 6-12 weeks postpartum, then annually
Identification and Diagnosis of Pre-diabetes and Type 2 Diabetes	• Perform fasting plasma glucose test or oral glucose tolerance test	Test all adults ≥age 45 (see original guideline document for testing of Type 2 diabetes in children and adolescents); if normal

Concern	Care/Test	Frequency
		and person has no risk factors, retest in 3 years or less.

*Consider more often if A1c ≥7.0% and/or complications exist.
**Consider referring to provider experienced in care of women with diabetes during pregnancy.

CLINICAL ALGORITHM(S)

Clinical algorithms are provided in the original guideline document for:

- Type 2 Diabetes: Glycemic Control Pathway
- Treatment of Hypertension
- Screening and Initial Recommendations for Diabetic Kidney Disease (Microalbuminuria, Macroalbuminuria, and estimated glomerular filtration rate [eGFR])
- Diabetic Foot Ulceration
- Diabetic Foot Infection
- Charcot Foot
- Screening Adults for Pre-Diabetes and Type 2 Diabetes

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based on results of clinical trials, accepted science, and expert opinions.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Overall Potential Benefits

- Prevention, early detection, and aggressive treatment can have a significant impact on the quality of life for people who have diabetes.
- The management goal for diabetes is to achieve optimal glycemic control to prevent acute and chronic complications.

Specific Potential Benefits

Self-Management Education

The primary goal of diabetes self-management education (DSME) is to provide knowledge and skill training, facilitate problem solving, help people identify barriers to change, and nurture the development of coping skills with the goal of achieving effective self-management and behavior change.

Medical Nutrition Therapy (MNT)

MNT can assist with the prevention of Type 2 diabetes, management of existing diabetes, and preventing (or at least slowing) the development of costly diabetes-related complications and hospitalizations. MNT can assist people at risk for or with diabetes to make informed and beneficial dietary changes to assist in reducing the amount of oral medication(s)/insulin needed to optimize glycemic control.

Cardiovascular Care

Aggressive assessment, prevention and treatment of cardiovascular disease through lifestyle modifications and medical interventions can lead to preventing the development of cardiovascular complications, and the prevention or reduction of occurrences or recurrences of events, enabling people with diabetes to lead healthier and longer lives.

Kidney Care

Early detection and intervention, along with improved glycemic and blood pressure control, can help reduce the risk of the development and progression of nephropathy. Screening for, and treatment of, early kidney disease resulting from diabetes adds years to life and is proven cost-effective.

Eye Care

Studies show that early detection and proper treatment reduces the risk of diabetic retinopathy and blindness by 50-60%. In addition, proper glycemic control can reduce the risk of progression of retinopathy by 34-76%. For each two unit decrease in A1c (e.g., A1c of 8.5% to 6.5%) there is a 50-75% reduction in complications. Retinal screening exams and early can result in increased years of sight and also assist with cost savings. Diabetic retinopathy is preventable; and, optimal glycemic control and blood pressure control can reduce its severity.

Neuropathies and Foot Care

Improved glycemic control and reduced variations in blood glucose excursions can slow the progression of neuropathy. Simple prevention strategies may reduce the rate of lower extremity complications in people with diabetes.

Oral Care

Individuals can avoid the negative outcomes of periodontitis through early screening, referral, and treatment.

Emotional/Sexual Health Care

Early recognition of depression symptoms, prompt treatment, and referral may lead to improved diabetes self-care and quality of life.

Influenza and Pneumococcal Immunizations

Immunizations can prevent serious illness, complications, hospitalizations, and death associated with influenza and pneumococcal disease.

Preconception and Pregnancy Care

Preconception counseling, intensive management to optimize glycemic control before pregnancy and during pregnancy, and utilizing a team of providers experienced in caring for women with diabetes can help at-risk women achieve health outcomes similar to those of women without diabetes.

Identification and Diagnosis of Pre-diabetes and Type 2 Diabetes

Without lifestyle changes, most people with pre-diabetes will develop Type 2 diabetes within ten years. Lifestyle modifications, such as dietary changes, a 5-10% weight loss, and increased physical activity (recommended 30 minutes a day, at least 5 days a week) can help return blood glucose levels to a normal range for many people.

POTENTIAL HARMS

For information on side effects of diabetes medications, see "Medication Update for Diabetes Mellitus - 2008" at the end of Section 4 in the original guideline document.

For information on side effects of lipid medications, see "Lipid Medication Update" at the end of Section 5 in the original guideline document.

For information on side effects of smoking cessation products, see "Quite Tobacco Series: Medication Chart" at the end of Section 5 in the original guideline document.

CONTRAINDICATIONS

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For information on contraindications of diabetes medications, see "Medication Update for Diabetes Mellitus - 2008" at the end of Section 4 in the original guideline document.

For information on contraindications of lipid medications, see "Lipid Medication Update" at the end of Section 5 in the original guideline document.

Angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers are contraindicated in pregnancy.

QUALIFYING STATEMENTS

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The Guidelines are population-based and therefore intended to be appropriate for most people with diabetes, but not intended to define the optimal level of care that an individual person may need. Clinical judgment may indicate the need for adjustments appropriate to the needs of each particular person (e.g., age, medical condition, or individual glycemic control goal).

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

Quality Improvement

Quality improvement is important in assuring optimal care for people with diabetes. Implementing evidence-based guidelines such as the *Wisconsin Diabetes Mellitus Essential Care Guidelines* is an example of improving quality care for people with diabetes in a health system or organization. In addition, the *Guidelines* set a standard of care for which to measure an organization's quality improvement in care. Possible data sources to audit care in a patient population include medical records (paper or electronic), patient registries, administrative claims data, pharmacy records, lab records, or patient surveys.

IMPLEMENTATION TOOLS

Audit Criteria/Indicators
Chart Documentation/Checklists/Forms
Clinical Algorithm
Foreign Language Translations
Patient Resources
Quick Reference Guides/Physician Guides
Resources
Wall Poster

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Living with Illness
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Wisconsin Diabetes Advisory Group. Wisconsin diabetes mellitus essential care guidelines. Madison (WI): Wisconsin Diabetes Prevention and Control Program; 2008. Various p. [17 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2004 Dec (revised 2008)

GUIDELINE DEVELOPER(S)

Wisconsin Diabetes Prevention and Control Program - State/Local Government Agency [U.S.]

SOURCE(S) OF FUNDING

Centers for Disease Control and Prevention (CDC), Division of Diabetes Translation

GUIDELINE COMMITTEE

Guideline Revision Workgroups
Wisconsin Diabetes Advisory Group

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Wisconsin Diabetes Advisory Group. Wisconsin essential diabetes mellitus care guidelines. Madison (WI): Wisconsin Diabetes Prevention and Control Program; 2004. Various p. [246 references]

GUIDELINE AVAILABILITY

Electronic copies: Available from the Wisconsin Diabetes Prevention and Control Program Web site.

Print copies: Available from the Diabetes Prevention and Control Program, Wisconsin Division of Public Health, PO Box 2659, Madison, WI 53701-2659; Phone: (608) 261-6855

AVAILABILITY OF COMPANION DOCUMENTS

The Wisconsin Diabetes Advisory Group has made available a variety of implementation tools included in the original guideline document:

- Body mass index (BMI) tables for adults
- Growth charts for children
- Diabetes self-management education records
- Diabetes patient flow sheet/chart audit tools
- Diabetes sick day plan
- Diabetes eye exam consultation form
- Annual comprehensive diabetes foot exam form
- Office poster (available in English, Spanish, and Hmong)
- High-risk foot stickers for patient record
- Diabetes dental referral form
- Patient Health Questionnaire (PHQ-9)
- Diabetes population-based indicators

- Personal diabetes care record cards (available in English, Spanish, and Hmong)

Electronic copies: Available in the original guideline document and from the Resources section of the Wisconsin Diabetes Prevention and Control Program Web site.

PATIENT RESOURCES

The following is available:

- Diabetes self-management information and record booklet. Madison (WI): Wisconsin Diabetes Advisory Group. Department of Health and Family Services, Division of Public Health, Diabetes Prevention and Control Program. 2008. 12 p.

Electronic copies: Available in Portable Document Format (PDF) from the Wisconsin Diabetes Prevention and Control Program Web site.

Print copies: Available from the Diabetes Prevention and Control Program, Wisconsin Division of Public Health, PO Box 2659, Madison, WI 53701-2659.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

This NGC summary was completed by ECRI on July 22, 2005. This NGC summary was updated by ECRI Institute on February 16, 2009. The updated information was verified by the guideline developer on April 7, 2009.

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